notes, as well as for the help in diagnosis in this case, which had it not been for him would have probably remained obscure.

ASPHYXIA PALLIDA

By DAVID PERERA

Medical Officer, Poonagalla Group Hospital Bandarawela, Ceylon

ON 1st September, 1931, at 8 p.m. I was called in to attend on an Indian lady who was in protracted labour pain. The patient was about 37 years of age and a multipara, this being her tenth baby. Her last child was still-born and was delivered with the aid of instruments. She had apparently been in labour for 3 days and the membranes had ruptured early that morning. I found her in a very exhausted condition with hardly any pain then present. The patient insisted on the baby being extracted under chloroform, as on the previous occasion. I gave her an injection of 0.5 c.cm. of pituitrin and a short time after she developed vigorous pains and delivered a baby girl in a lifeless condition, with a very long cord wrapped round her chest and neck, and her head hanging. We released the cord and extracted mucus from the mouth with the aid of a mucus extractor, put the baby into a hot water bath, and inserted the middle finger into the rectum—as advocated by Dame Louise Maclory, and recommended by Lieut.-Col. Green-Armytage (1930). Unfortunately I had no adrenalin chloride in my bag; however, a third part of a 0.5 c.cm. bulb of pituitrin was injected into the biceps, and after a few minutes the baby started to breathe in a gasping manner. After another half hour she commenced to cry and to breathe normally. The baby was kept in the bath for two hours; after this Eau de Cologne was applied, the infant was wrapped up in flannel, and handed over to the attendants.

Since this case we have saved several babies from white asphyxia by this simple method, with and without injections.

REFERENCE

Green-Armytage, V. B. (1930). Ars Obstetrica. *Indian Med. Gaz.*, LXV, 18.

A CASE OF SEBACEOUS HORN

By PHANIBHUSAN MUKERJEE, L.M.P.

Chakmehsi, Darbhanga

A HINDU Brahmin male, a priest by profession, aged about 65, a resident of a neighbouring village, presented himself to this dispensary in July 1930 for the treatment of a horny growth, which was projecting outwards from the middle of the left side of his chest, like a finger, $2\frac{1}{2}$ inches in length; the distal part was bent a little downwards.

The patient stated that about a year ago the tumour appeared as a small pimple which gradually increased in size. At first it was soft but tender. After about 6 months of its development the growth burst and out of it came a thick creamy fluid. The discharge continued for two months, but the tenderness subsided a little. Subsequently the oozing stopped and the mouth of the wound closed of itself, whereafter the tumour began to grow hard, painful and tender. As the growth increased steadily in size, the pain and tenderness were aggravated, so much so that the patient was unable to put on any clothes, the very contact with which caused much pain and made him miserable.

The steady growth of the tumour and the constant pain compelled him to seek relief and he came to this dispensary for treatment.

Treatment.—Due asepsis having been observed, a circular incision was given round the tumour at its base. It was freed from adhesions and excised. The part was touched with tincture of iodine, a few stitches applied and finally the wound was sealed up with compound tincture of benzoin. The wound healed in about a week.

On removal, the tumour looked very much like a curved finger; it was horn-like in appearance and feel; and it measured two and a half inches in length and a quarter of an inch in diameter. It has been sent to the pathological department of the Darbhanga Medical School, where it is kept as a specimen.

In Rose and Carless' Surgery the description of sebaceous horn is given, as quoted below:—

'Left to themselves the sebaceous cysts may attain considerable dimensions, whilst the walls and contents become calcified. Occasionally the exudation oozes through the duct, and dries on the surface, with just sufficient cohesion to prevent it from falling off; layer after layer of this desiccated material is deposited from below, finally giving rise to what is known as a sebaceous horn'. 'These become dark in colour from admixture with dirt, and are always more or less fibrillated in texture'.

From the history of this case, it would appear that the tumour was at first a cyst which after some time burst; the discharge continued for some time, stopped and finally the horny projection was formed. The tumour is dark in colour and appears fibrillated in texture as described by Rose and Carless.

More than a year has elapsed since the tumour was excised, no recurrence has yet taken place and the patient is doing well.

As such cases are rarely met with in practice, I am sending the notes for publication.

Special Articles

GYNÆCOLOGY IN THE TROPICS

POST-GRADUATE CLINICAL LECTURE NOTES

(CONTINUED)

By V. B. GREEN-ARMYTAGE, M.D.

F.R.C.P. (Lond.), F.C.O.G.

LIEUTENANT-COLONEL, I.M.S.

Professor of Midwifery and Gynæcology, Calcutta Medical College, and Surgeon to the Eden Hospital for Women, Calcutta

STOCK-TAKING is as important in surgery as in business, for it allows a review of technique and results which is of advantage to both surgeon and patient.

An experience of over six thousand abdominal operations convinces me that, in the tropics, the surgeon who can operate rapidly or 'to the clock', and aims at a minimum of bleeding gets the best results, for just as post-partum hæmorrhage is often fatal from shock or sepsis in the East, so is hæmorrhage in gynæcological surgery, where two-thirds of one's patients are debilitated or suffering from long-standing morbid pelvic conditions.

With this conviction I thought it would serve a useful purpose to consider the subject of hysterectomy, for, admitting the frequent necessity of this operation, general practitioners and nurses and, through them, the public, form the erroneous idea that such an operation is commonly fatal, with the result that patients put off surgery, and oftentimes arrive with uterine conditions that have been allowed to exist far too long or have been *mistreated* by radium and *x*-rays.

For this reason and without any bias, I am presenting to you my results obtained in the Eden Hospital during the last ten years, which have been collected by my registrar, Dr. Radha Raman Roy, omitting entirely my results obtained in private cases, for they, being mostly pure Europeans and cases seen early and in good health, would vitiate the point I want to make—a point I may say which is entirely to the benefit of Indians and Anglo-Indians—namely, that in the hands of an experienced surgeon the mortality of hysterectomy is under 5 per cent.

For instance, take vaginal hysterectomy, a procedure of which the great French surgeon Doyen used to say that 'no man could call himself a gynæcologist unless he could do this operation in private'.

The indications for vaginal hysterectomy in the tropics are many, and it has quite peculiar attractions for patients in India, who will allow any operation from below rather than have their 'stomachs cut'.

The technique should be nearly bloodless and there is no shock. It is particularly applicable for ovarian menorrhagia; for chronic metritis; for cancer of the body of the uterus, the so-called pre-cancerous, eroded, lacerated cervix; and for fibroids up to the size of a tennis ball. Very occasionally it is useful in a case of prolapse.

My hospital registrar reports that 190 of these operations have been performed during the last ten years with a mortality of 9, *i.e.*, a death rate of 4.7 per cent. During the same period in the same class of patient, 350 subtotal hysterectomies have been performed with a mortality of 18, *i.e.*, a death rate of 5.1 per cent., whereas 375 total hysterectomies have been done with a mortality of 21, *i.e.*, a death rate of 5.6 per cent.

I think if these unbiased statistics were realised by doctors and patients alike there would be far less delay in sending cases to hospital, for it is hardly necessary to state that many of our hospital cases arrive in a desperate clinical condition, so making our mortality for hysterectomies in the Eden Hospital, almost exactly double that of hospital surgeons in the West.

This finding is of additional interest, in that, last year when I published my results of 547 operations for ovarian tumours in the Eden Hospital, I found that my average total mortality for innocent tumours was 5 per cent., a ratio almost double that of Great Britain, the explanation being of course, as you know, that ignorance and prejudice delay a patient's arrival at hospital in India, until her clinical condition is desperate.

For obtaining such results my sincerest thanks must be tendered to the skilled pre- and post-operative care of my house and nursing staff.

In addition, I have asked Dr. Roy to collect the number and results in connection with extra-uterine gestation during the last ten years, for here again, because of fear of operation or bad diagnosis, patients are oftentimes brought to hospital almost *in extremis*.

The total number of cases is 106, with an operative mortality of 9, *i.e.*, a death rate of 8.5 per cent.

The operations undertaken show that 51 were tubal pregnancies, 2 were in the broad ligament, 45 were ruptured tubal gestations, and 8 were secondary abdominal pregnancies.

Cancer of the cervix

In the East, cancer of the cervix is extremely frequent, its common incidence under the age of 30 being due to early marriage and early child-bearing. Unfortunately, owing to ignorance and prejudice, the diagnosis is an easy matter, for 9 out of 10 cases presenting themselves are beyond the permanent help of radium or surgery. It is for this reason that every regard should be paid to all predisposing causes of cancer of the cervix such as lacerations. For an erosion, associated with or without laceration of the cervix, is an inflammatory reaction of the tissues to infection and irritation. We should, therefore, drop the term 'erosion' for the correct title 'cervicitis', an erosion being the outward and visible sign of an inward and invisible inflammation of that pelvic tonsil, the cervix.

The recent work of Bailey, based upon the histological examination of 850 specimens of the cervix, shows that the relationship of chronic cervicitis to cancer of the cervix, is affected through the agency of a factor common to both, namely, an associated inflammatory exudate in contact with the cervix. As a result of this inflammation, bacterial or chemical irritants in the cervix initiate cell proliferation. This being so, it is the duty of the general practitioner to investigate the cervix with a speculum in all cases of discharge in a parous woman.

Again and again during the last ten years I have inveighed against tinkering gynæcology. By this I mean the almost disgraceful way in which so many of these cases are still treated by so-called gynæcologists—I refer of course to such methods as repeated weekly or bi-weekly paintings of the cervix with acids or caustics, which while doing no good to the patients, swell the banking account of the doctor.

The only treatment is either radical electro-cauterization, using the comparatively cheap post-cautery, supplied by Thackray of Leeds, or amputation of the cervix. I have used the former method in hundreds of cases now, and can categorically state that if the patient will douche twice a day with a salt solution for six weeks afterwards, she will be cured. Moreover, many patients who have been so treated have become pregnant again after long periods of comparative sterility, caused by the discharge from the cervix having killed or inhibited the passage of the spermatozoa.

Post-cautery treatment needs no anæsthetic in most cases, and can be done in the consulting room.

The disadvantage of the Bonney amputation is post-operative sterility, a sequela which does not take away from its attractiveness to many.

In India the treatment of cancer of the cervix is practically the one word 'radium'. But because the cases are invariably seen late the results are most disappointing. It is a terrible statement to make but nevertheless a true one that out of scores of cases of cancer of the cervix that I have seen during the last ten years, not one treated by radium has been alive at the end of two years. Whereas four early European cases, all diagnosed microscopically beforehand, are alive 5, 6 and 8 years after operation.

In view of these facts it is important that both laymen and doctors should understand that in Europe the proportion of absolute cures after either radium or operation in early cases is about the same, namely 35 per cent. only.

To show you the frequency of cancer, I have asked my registrar to collect our out-patient statistics for the last ten years. He shows that 542 new cancer cases attended and that this number makes a 1.10 per cent. proportion of the total out-patient attendance. This fact should dispel for ever the statement made by European cranks that cancer does not occur in India.

Benign hæmorrhage from the uterus

Every now and then you will be faced by cases of this nature. There is no fibroid, no placental polypus, no cancer, no enlargement of the uterus, no inflammation of the tubes and ovary, no retroversion, no cervicitis, and yet the patients bleed 10 to 15 days every month and the 'periods' recur nearly every two weeks.

Blood examinations do not show anything beyond anæmia.

What is the cause of this bleeding?

In young unmarried girls, undoubtedly hypothyroidism is a cause, for the exhibition of thyroid and iodine, together with change of climate and a full calcium diet will often cure such cases in six weeks, but in older women the problem is by no means so easy, for with or without any metritis there is great hyperplasia of the lining membrane of the uterus—indeed, an exaggeration of the normal premenstrual congestion of the endometrium.

In a great many such cases I have done vaginal hysterectomy and in some abdominal hysterectomy, but the interesting point is that in two-thirds of these patients I have found the ovary hard and atrophic, whereas in the remaining third the ovaries were swollen and œdematous, presenting the appearance of glistening testicles.

With our recent knowledge of the female sex hormone these findings suggest that the hyperplasia of the endometrium is due to non-formation of the stratum granulosum of the corpus luteum, for repeatedly I have been unable to find any lutein formation in either type of ovary.

The absence of a corpus luteum suggests that the hæmorrhage is due to an excess or uncountered action of hormones from an unruptured Graafian follicle, for we know that when a follicle is able to burst on the surface, and the escaping ovum dies, the stratum granulosum of the corpus luteum supplies a hormone which causes complete necrosis or disintegration of the endometrium—this necrosis is menstruation.

Admittedly this is a theory based on clinical findings, but such pathology of the living does, I think, correctly interpret the severe hæmorrhage which is frequently found in association with either cirrhotic or œdematous ovaries without corpora lutea.

These cases are sometimes cured by curettage. Occasionally the exhibition of thyroid and iodine by the mouth seems to do good—the reason possibly being due to the capacity of thyroid and iodine for absorbing fibrous tissue.

Some authorities advocate deep *x*-rays or radium, which may or may not produce temporary amenorrhœa followed by a recurrence of hæmorrhage. Personally I prefer operative treatment, being disappointed by the many failures I have seen after radium and deep *x*-rays.

For instance, Mrs. M., aged 36, was treated by 9 sittings of deep *x*-rays in January and February 1931. She had total amenorrhœa till July when profuse hæmorrhage began again. I performed vaginal hysterectomy.

(2) Mrs. K. had radium in England in May 1930. In November the hæmorrhage began again. In January 1931 I did an abdominal hysterectomy.

The acute abdomen

Well has it been said that the barren field of the umbilicus is the Waterloo of every practitioner, for you will not be long in practice before you are called to a female patient with acute abdominal pain. It is therefore important that I loosen the anchors of your memory by reminding you of a few tests and physical signs, for apart from gall bladder, gastric or renal crises, the emergency catastrophies of women in India are many. For instance:—

(1) *Ruptured ectopic pregnancy* may occur without any preliminary pain or noticed menstrual disturbance, but apart from pain, collapse, or rigidity, the diagnosis is certain if the patient has acute pain in the supra-spinous fossa of either shoulder; such pain is, of course, due to blood percolating between the liver or spleen and diaphragm, and stretching the phrenic nerves. Moreover, you can make absolutely sure, if still in doubt, by inserting a speculum and passing the needle of a Record syringe into the pouch of Douglas. Free blood can only mean a ruptured ectopic gestation, or that rare condition, profuse hæmorrhage from an ovarian follicle.

(2) *Acute salpingitis or pelvic peritonitis* is not always of gonorrhœal origin; it may occur in patients whose social status makes such enquiry extremely difficult. Moreover in India you may be prevented from making a vaginal examination. Therefore remember that the pain and rigidity are usually below the umbilicus and bi-lateral and that the area of epicritic hyperæsthesia to the prick of a pin is of increasing intensity downwards from a line drawn joining the two anterior superior spines; and that if you pick up between your finger and thumb a portion of the skin and subcutaneous tissue and lift it off the abdominal muscle, below this line, you will find the same increasing hyperæsthesia.

(3) In rare cases *fulminating appendicitis* will give you difficulties in diagnosis from acute salpingitis, but in such a case these two tests are invariably on the right side only. A vagino-rectal examination will, of course, make clear any case of doubt. Acute appendicitis or so-called *appendicular colic* with fever in women is often diagnosed in India when the real cause is a leaking tubal gestation or a twisted ovarian cyst or a *B. coli* pyelitis. If the appendix is at fault you may obtain confirmation by Rovsing's sign, which is elicited by pressing on the pelvic colon in the left iliac fossa. This forces gas backwards into the cæcum giving rise to pain in the right iliac fossa, which is diagnostic of appendicitis. A retro-cæcal appendix, when inflamed, is very difficult to diagnose from pyelitis or even cholecystitis. In such a case Baldwin's test, if positive, is very useful. This test consists of pressing lightly with a finger on the most tender spot in the flank and then asking the patient to lift her right leg off the bed keeping the knee stiff. If she complains of an increase in pain, or promptly drops the leg with a cry, the test is positive.

A vaginal or recto-vaginal examination should, of course, always be done to eliminate the possibility of an extra-uterine gestation or the presence of an ovarian tumour twisted or inflamed. The most frequent type of tumour to twist or inflame is, in my opinion, a dermoid.

On several occasions I have been asked to see women, who had attacks of right-sided colicky pain in the intervals between the 'periods' where no question of extra-uterine pregnancy existed. Most of these cases I am sure are due to a little excess of bleeding into the peritoneal cavity after rupture of a Graafian follicle between the 13th and 17th day after the commencement of the menstrual cycle. Moreover, many gynæcologists must be aware of cases where in the course of a vaginal examination they have ruptured such a follicle; the effusion of fluid shortly giving rise to colicky pain in the abdomen.

(4) A *ruptured pyosalpinx* is one of the catastrophies of gynæcology, for if the pus is not localized it may give rise to all the physical signs and appearances of general peritonitis, necessitating immediate laparotomy. On the other hand, if the pus is localized behind the uterus or between the uterus and the anterior abdominal wall, you will obtain, in the one case, confirmation by the passage of mucus from the anus (irritative diarrhœa), while, in the other, there will be strangury. An exploratory needle will make matters clear.

(5) *Pyelitis* is very common in India. The presence of pus cells and albumen in the urine of a patient with acute pain on the right side and fever should always make you think of *B. coli* bacilluria, especially if the patient is pregnant.

You will have noticed that I have not mentioned the matter of leucocytosis, important though it be, because when its diagnostic value would be greatest in the earlier stages it is rarely present, therefore you must depend most upon your clinical acumen, for remember the old saying 'Faith, Hope, and Charity, and the greatest of these is Charity'. Prognosis, diagnosis and treatment, and the greatest of these is diagnosis.

(6) Occasionally you will see cases of *acute abdominal pain in pregnancy*. First eliminate such things as twisting of a tumour, obstruction, worms, cholecystitis, appendicitis, or the cramps of tetany and osteomalacia.

Then concentrate on the discovery of a cause for a degree of toxæmia which may cause hæmorrhage into the wall of the uterus; so never fail to examine the urine properly, for the presence of Wright's 'H substance', derived from extravasated blood in endothelial tissues, always causes albuminuria and collapse.

(7) Every now and then you will be asked to see a patient who is known to have an *ovarian cyst* and who has refused operation. You are called because she has intense colicky pain. Don't necessarily rush into the diagnosis of torsion, but remember that one of the loculi may burst into the general peritoneal cavity causing intense irritation, the interesting feature of such an incident being that diagnosis is certain if almost immediately there is intense diuresis.

Spinal anæsthesia

In India the fear of chloroform anæsthesia is often shared by patient and surgeon alike, it is for this reason that post-graduates should know and practise the art of spinal anæsthesia, for since Pitkin's work has been confirmed by thousands of operations there is no reason for fear. Pitkin likens the behaviour of his solution of Spinocaine, on entering the thecal tube, to a bubble floating in a spirit level. Thus, with the spine horizontal paraplegia will be produced up to the segment of the cord opposite the level of injection, and by tilting the head of the table downwards, only the parts supplied by the lumbar thecal nerves are paralysed, whereas by tilting the head of the table upwards the paraplegia extends to the chest. Thus posture determines the distribution of the Spinocaine. In order to combat the drop in blood pressure and that alarming cold sweating that used to occur, we now inject hypodermically a solution of ephedrine and novocaine in the lumbar region, just before the spinal puncture. There are no difficulties in the method if you will but remember that when you raise the head of the table the neck and head of the patient must be acutely tilted downwards by placing a sand bag under the shoulders. I have used this method with great success at the Eden Hospital, whenever the general condition of the patient prohibited general anæsthesia; as, for instance, in a Cæsarean section on account of acute yellow atrophy of the liver, and in implantation of the ureters into the rectum in a debilitated patient.

Spackman of Bombay using the same technique with Percaine also reports enthusiastically on this method in 71 operation cases in the upper and lower abdomen, and there can be no question that the liability to lung complications, which so frequently jeopardises surgery of the upper abdomen in India, is greatly lessened by the use of Spinocaine or Percaine spinal anæsthesia.

I trust that many of you will try this method, for as Spackman says, and you all know, 'general anæsthesia in India affords more anxiety to the operator than to the patient'.

Pernoctan

This intravenous hypnotic is of particular value to gynæcologists in India, for fear of chloroform is almost as great amongst women as is that of operation.

For test purposes I used it in 50 consecutive cases in private practice and in hospital, giving the dosage prescribed per body-weight. It is cheap and allays all anxiety.

Chloroform should not be given with it and in major operations, such as hysterectomy, the quantity of ether given only amounted to 4 to 6 ounces, and this in the hot weather.

The patient sleeps for several hours after operation and awakes without pain, though morphia can be given, if necessary. There is no vomiting. The fact that the injection is given to the patient in her bed, without first removing her to the theatre or anæsthetic room, will appeal to all gynæcologists.

So far as my own experience goes I have but one regret and that is that Pernoctan is contra-indicated in patients with fever at the time of operation.

Inoperable cancer

Last year I referred to the medical treatment of those advanced cases of cancer which so frequently come before us in India, cases either of recurrence after operation or too late for surgical interference.

So long ago as the 16th century, lead was used by Ambroise Paré and, more recently, has been employed by Blair Bell, but with a considerable mortality.

For this reason selenium, in a colloid form combined with lead, was tried by Todd of Bristol (*vide The Lancet,* August 23, 1930) after many experiments, the idea being to develop the technique for hopeless cases as an addition to the present surgical and radiological treatment. The colloid is of low toxicity and is given by intravenous injections at weekly intervals, the size of the latter injection depending upon the amount of focal and general reaction. The reaction lasts for about 24 hours, and when this is over, the patient feels better, with an increased appetite and diminished pain. In sarcomata we increase the dose by 1 to 2 c.cm. per week and in epitheliomata by 2 to 4 c.cm.

Selenium is a stimulus to the defensive action of the tissue, around and about the cancer, for subsequent to treatment there is an increase of lymphocytes, plasma cells and eosinophiles in the blood, and a great hyperplasia of fibrous tissue.

In addition to the injection it is very important to insist that the patient shall take food substances rich in vitamines A and D, such as liver, milk, eggs, etc., daily, for we know that cancer tissue and the plasma of cancer patients show a poverty of calcium, proportional to the rapidity of the growth of the cancer.

For this reason Todd prescribes a drachm of calcium chloride a day and Radiostoleum or Irradol together with small doses of thyroid extract, as a tonic for the purpose of stimulating metabolism and immunizing processes; he

is of opinion that radium and deep *x*-rays should not be used while colloid treatment is being carried on, for if they are used the symptoms and tumour increase in magnitude.

When at Home recently I visited Dr. Todd and he very kindly showed me scores of cases under treatment, most of them desperate cases, sent to him from all over England by other surgeons. Having seen these cases, many of them alive for years, the tumours having sclerosed and shrivelled up, I feel we should give it a fair trial. I have many cases at present under treatment in our out-patient department. The colloid can be obtained—10 c.cm. for Rs. 3-12 in ampoules from Mr. Clark, agent for British Drug Houses Ltd., 27/4, Waterloo Street, Calcutta.

Inoperable vesico-vaginal fistulæ

The operation of implantation of the ureters into the bowel is of considerable antiquity, and was first performed successfully for ectopia vesicæ by Peters and Lendon in 1900. Since then the technique has been greatly improved and thanks to the work of Bond, Stiles, Mayo, Grey-Turner and Coffey, the indications for this operation have multiplied, genito-urinary surgeons using it in cases of cancer of the bladder, or prostate, ectopia vesicæ and multiple perineal fistulæ; while gynæcologists employ it for inaccessible and inoperable vesico-vaginal fistulæ, for although such cases may be rare in the West, in the tropics, as a result of crippling osteomalacic deformity, or obstetric complications, where indifferent medical aid was available, it is no uncommon thing to see cases where cartilaginous scar tissue makes up the floor of the pelvis throughout which the upper wall of the bladder prolapses. In other cases scar tissue or bony deformity, due to falling in of the rami of the pubes, permits only the passage of one finger into the vagina, at the top of which the soft mucous membrane of the bladder can be left.

The condition of these patients, often only in their teens, is pitiable. For this reason many of us have tried out every known operation for fistula, and only within recent years have we arrived at any satisfactory conclusion, and that is implantation of the ureters into the bowel. But unless the set of the operation was perfectible surgeons have been deterred from carrying it out because of the initial cost and difficulties in the technique of Coffey's operation.

For this reason I have striven, during the last few years, to devise a technique easy and palatable to all surgeons wherever situated, the strategy being that of Coffey, namely, the formation of a gutter and valve-like mechanism in the bowel wall, as opposed to a sphincter, the tactics being that of simplicity, doing a one- or two-stage operation according to the general health of the patient.

Briefly stated I pass a flute-ended ureteric catheter up the ureter, and then, after inserting a 10-inch silver tube through the hole in the gut down to the anus, I pass the proximal end of the catheter through this tube. The silver tube is then removed by an assistant. The catheter-containing ureter is then laid in the bowel gutter and sewn over, following the method of Coffey. An illustrated account, in detail, will be published later. The advantages of this method are:—

(1) Simplicity.

(2) One or both ureters can be implanted at one sitting.

(3) Owing to the fact that a catheter is in the ureter there is no likelihood of an inflammatory exudate compressing the ureter in the bowel gutter and so giving rise to surgical uræmia.

THE USES OF MUSTARD IN MEDICINE

BY A CORRESPONDENT*

FOR many years the value of mustard and its preparations in the treatment of disease has been recognised, and it would be difficult to find a reputable work on medical treatment which does not contain favourable references to the mustard bath, pack and poultice, etc. As such references, however, are scattered throughout the large field of medical literature, and as fresh suggestions for the therapeutic uses of mustard are frequently being published, there seems reason to believe that an article in which the known medical applications of mustard are collated may be of value to the prescriber.

It is generally asserted that all the physiological effects of mustard are due to the presence of the volatile oil contained in black mustard seeds, and liberated when they are moistened with water. This statement is no doubt true in its essentials, but since practically no work has been carried out on the non-volatile oil of *white* mustard, and since the mustard flour of commerce is usually prepared from both varieties of seed, it is clear that it is inadvisable to be too dogmatic in explaining the physiological effects of mustard as a whole.

For the present, however, it is necessary to confine this article to volatile oil of mustard, the oleum sinapis volatile of the *British Pharmacopœia*. When crushed black mustard seed, or the flour therefrom, is moistened with cold or warm water, this volatile oil is rapidly evolved, being formed by the interaction of an enzyme, myrosin, with an organic compound known as sinigrin, which belongs to the group of glucosides so widely distributed in the vegetable kingdom. Myrosin, like other enzymes, is destroyed by heat, so that when mustard is added to hot water no volatile oil is formed. A temperature of about 60°C. (140°F.) is sufficient to destroy the enzyme completely, but even at lower temperatures than this the evolution of volatile oil is impaired.

The primary action of mustard oil upon the skin is to cause a dilation of the capillaries, yielding a sense of warmth and a 'tingling' sensation, pleasant at first, but rapidly becoming unbearable. A red flush is seen at the site of application, followed eventually by a wheal, similar to that produced by a burn. The physiology of these changes is very fully dealt with by Sir Thomas Lewis. His researches have proved that skin

* Since we sent this article to press it has appeared in the same form in the *Medical Journal of South Africa* to which journal we now make acknowledgment.—EDITOR, *I. M. G.*